REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars:

In the claims

Claims 20, 30, 35, and 42 have been amended to correct their dependencies. Claims 33 and 39 have been amended to correct obvious typographical or grammatical errors. Claim 39 has been amended to now recite "printed conductive paths are applied to the card body and the chip on the outside thereof."

Rejection of claims 20, 30, 35, and 42 under 35 U.S.C. § 112, second paragraph

Claims 20, 30, 35, and 42 presently stand rejected as being indefinite. In particular, the examiner notes that these claims depend from cancelled claims. Claims 20, 30, 35, and 42 have been amended to correct their dependency. In view of the amendments made, withdrawal of the rejection is respectfully requested.

Rejection of claims 18, 20-22, 27, 30-33, 35-39, and 42-51 under 35 U.S.C. § 103(a)

Claims 18, 27, 33, and 39 presently stand rejected as being unpatentable over Lang et al (U.S. 6,046,073) in view of Grupen-Shemansky (U.S. 5,268,065). This rejection is respectfully traversed for at least the following reasons.

Claims 18 and 27 set forth a method for incorporating a chip into a smart card, wherein a chip having front and back sides, the chip being thinned from the back side, is applied to a surface of the smart card with the front side of the chip facing outwardly from the smart card surface. Stated differently, the thinned back side of the chip is applied to the smart card surface. Once the chip is applied to the smart card surface, conductive paths are provided on the card and the chip.

It is respectfully submitted that Lang and Grupen-Shumansky fail to form a prima facie basis of obviousness of claims 18 and 27 because Lang and Grupen-Shumansky

together fail to disclose or suggest each and every element set forth in claims 18 and 27, and because there is no motivation or suggestion to combine the references.

Lang fails to disclose or suggest applying a chip to a surface of a smart card with the front side of the chip (the active side) facing outwardly from a surface of the smart card, and then providing conductive paths on the card and the chip.

Lang discloses a particular process for manufacturing thinned semiconductor chips to be incorporated into a chip card cavity. The problem stated by Lang is to process such thin chips since they break easily. (see *Lang*; col. 1, lines 38-40).

Lang therefore teaches first mounting a semiconductor chip on contact surfaces, with the active side (front side) applied to the contact surfaces. The chip is then, in a second step, thinned by removing silicon from the exposed rear side of the chip by a plasma etching process. (see *Lang*; col. 1, lines 49-61; col. 2, lines 6-22; col. 3, lines 39-46).

The contact surfaces are a part of a lead frame. (see *Lang*; col. 1, lines 66-67; col. 2, line 67; col. 3, lines 16-18). According to Lang, the chip is placed into the lead frame (and therefore in contact with the contact surfaces) prior to the plasma etching thinning process so that "since the individual chips are already fitted to a mount substrate, the thinness does not result in any problems in further handling." (*Lang*; col. 2, lines 20-22).

Lang provides no specific teaching or suggestion of a method of mounting the chip to a smart card. However, it is clear that, since the chip is applied to contact surfaces prior to the plasma etching process, and the contact surface lead frame is employed for subsequent handling of the chip, there can be no teaching or suggestion derived from Lang regarding providing a smart card and the chip, together, with conductive paths ***after the chip is applied to the card***. On the contrary, it is a clear teaching of Lang that a chip is applied to conductive paths (contact surfaces) prior to any application or mounting of the chip to any smart card or other device.

Further, Lang provides no disclosure or suggestion that, at any time, the chip is applied with its back side to any surface, or with its front (active) side directed outwardly from any surface. The teachings of Lang are confined to the process of applying the chip

with its active side in contact with the contact surfaces, and a subsequent plasma etching of the back side.

Accordingly, a basic difference between Lang and claims 18 and 33 of the present application is that, according to the present invention, the card and chip are provided with conductive paths only ***after*** the thinned chip has been applied to the surface of the smart card. This is in clear contradistinction to the teaching of Lang, since according to Lang it is important to first fit the chip to the contact surfaces and only thereafter carry out the thinning by etching the rear side of the chip.

Grupen-Shemansky provides no teaching or suggestion to overcome the shortcomings of Lang discussed above. The examiner asserts that "Grupen-Shemansky discloses a method for thinning a semiconductor wafer. As shown in the figures, back side 13 of semiconductor wafer 11 undergoes a mechanical grinding in order to thin the chip." However, Grupen-Shemansky provides no teaching or suggestion of a smart card, or of any method for applying a chip to a smart card, or to any method of applying conductive paths to a chip and a smart card surface.

Further, even assuming, *arguendo*, that Grupen-Shemansky offers any useful teaching or suggestion relating to the presently claimed invention, or to the shortcomings of Lang, there is simply no motivation or suggestion to combine Grupen-Shemansky with Lang. Since Lang teaches a method for thinning the back side of a semiconductor chip, there is simply no need to turn to Grupen-Shemansky for such teachings. Further, since Lang sets forth certain requirements for the thinning process (for example, that the chip be placed into a lead frame in contact with contact surfaces prior to the plasma etching thinning process) any modification to Lang according to the teachings of Grupen-Shemansky would either render the process non-functional, or would alter the principle of operation of the process.

Claims 27 and 39 set forth a smart card having at least one chip, the chip being disposed on a smart card body with the front side of the chip directed outward from the smart card surface, wherein printed conductive paths are applied to the smart card and the chip on the outside thereof.

Lang fails to disclose or suggest the invention of claims 27 and 39, since Lang fails to disclose or suggest printed conductive paths applied to the smart card and the chip. Further, Lang cannot be modified to employ printed conductive paths.

In Lang, contact surfaces make part of a lead frame. The basic differences between lead frame contact surfaces and printed contact surfaces is that lead frame contact surfaces are self-supporting, while printed conductive paths are not. According to the teachings of Lang, the self-supporting characteristic of the lead frame contact surfaces is crucial because they are provided for the handling of the thinned chips. More particularly, the thinned chips are fitted to the contact surfaces of the lead frame and are handled therewith.

For example, Lang teaches that "the leadframe or carrier element is disposed on a strip wound on a spool and carrying a multiplicity of leadframes or carrier elements. The individual process steps can thus be carried out using the so-called wheel-to-wheel process, that is to say the individual leadframes/carrier elements and semiconductor chips are passed through the individual process stations in the strip." (*Lang*; col. 2, lines 24-30).

Thus, self-supporting contact surfaces 2 of Lang cannot be replaced with printed conductive paths.

With regard to modification of Lang by Grupen-Shumansky, as noted above Grupen-Shumansky fails to disclose or suggest any method of applying conductive paths to a chip and a smart card surface, or any type of conductive path at all.

It is respectfully submitted that, for at least these reasons, Lang and Grupen-Shumansky, either individually or in combination, fail to form a prima facie basis of obviousness of claims 18, 27, 33, and 39, since the cited references fail to teach or suggest each and every element set forth in the claims, and because there is no motivation or suggestion for the combination of these references.

Accordingly, it is respectfully submitted that claims 18, 27, 33, and 39 and their dependent claims 20-22, 30-32, 35-38, and 42-45, and 49-51 are allowable over the cited references.

Claims 20-22, 30-32, 35-38, and 42-45, and 49-51 presently stand rejected as being unpatentable over Lang and Grupen-Shumansky, and further in view of Kohama et al (U.S. 6,412,701). This rejection is respectfully traversed for at least the following reasons.

With respect to claims 20-22, 30-32, 35-38, and 42-45, and 49-51, it is respectfully submitted that these claims are allowable for the same reasons set forth with respect to claims 18, 27, 33, and 39. Claims 20-22, 30-32, 35-38, and 42-45, and 49-51 depend from independent claims 18, 27, 33, and 39, and it is respectfully submitted that Kohama fails to supplement the deficiencies discussed above with respect to claims 18, 27, 33, and 39.

Independent claim 46 sets forth a method for incorporating a chip into a smart card, wherein a plurality of contacts are provided on an external surface of the smart card body, and a thinned chip is then placed over at least a portion of the contacts, the chip being applied to the external surface of the card body and permanently secured to the card body.

Claim 46 thus requires that the chip is thinned prior to its placement over at least portions of the plurality of contacts provided on the external surface of the card body. As discussed above, it is crucial for Lang to first place the chip on contact surfaces of a lead frame and then to thin the back side of the chip by etching. Only after this process can a resulting module (comprising the chip and the contact surfaces) be placed in a cavity of a chip card. Accordingly, the sequence of method steps defined in claim 46 is not disclosed in Lang. On the contrary, Lang teaches away from such a sequence since Lang requires placing the chip on the contact surfaces of the lead carrier before the chip can be thinned by etching. The additionally cited references fail to remedy this fundamental difference in Lang.

For at least these reasons, it is respectfully submitted that the cited references fail to form a prima facie basis of obviousness of claim 46. Therefore, it is respectfully submitted that claim 46, and claims 47 and 48 which depend from claim 46, are allowable over the cited references. Accordingly, withdrawal of the rejection is respectfully requested.

Conclusion

In view of the amendments to the claims, and in further view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is requested that claims 18, 20-22, 27, 30-33, 35-39, and 42-51 be allowed and the application be passed to issue.

If any issues remain that may be resolved by a telephone or facsimile communication with the Applicant's attorney, the Examiner is invited to contact the undersigned at the numbers shown.

Respectfully submitted,

BACON & THOMAS, PLLC
625 Slaters Lane, Fourth Floor
Alexandria, Virginia 22314-1176
Phone: (703) 683-0500

Date: September 5, 2006

JUSTIN J. CASSELL
Attorney for Applicant
Registration No. 46,205